Oct. 23, 2012

Warm-up

Nov. 8, 2017

Find the roots of each using the quadratic formula:

a) $y = 2x^2 + 17x + 30$ (-5/2, -6) b) $y = x^2 - 8x + 16$ (4, 4)

a b c

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(16)}}{2(1)}$

$\frac{8 \pm \sqrt{64 - 64}}{2}$

$\frac{8 \pm \sqrt{0}}{2}$ $\frac{8+0}{2}, \frac{8-0}{2}$

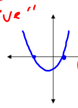
$x = 4$

Mar 12-11:43 AM

Nov. 8, 2017

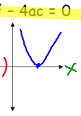
The discriminant reveals the nature of the roots. The discriminant is $b^2 - 4ac$ D , Δ

1. If the discriminant is positive, or
   (1) $b^2 - 4ac > 0$ there ~~are~~ two Real and Unequal ~~Roots~~
   "positive"



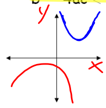
2roots

2. If $b^2 - 4ac = 0$ there ~~are~~ Real and Equal Roots (~~one~~ root)
   $x^2 - 8x + 16$
   $(-8)^2 - 4(1)(16)$
   $64 - 64 = 0$



1 root

3. If $b^2 - 4ac < 0$ (negative) the roots are Non-Real

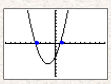


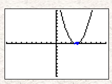
(no roots)

Example: Use the discriminant to determine the number of the rootsof each quadratic. $(b^2 - 4ac)$

1. $x^2 + 3x - 4 = 0$ (a b c)
   $(3)^2 - 4(1)(-4)$
   $9 - (-16)$
   $25 > 0$ ✓
   2 roots

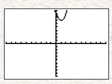
2. $0 = x^2 - 8x + 16$
   $(-8)^2 - 4(1)(16)$
   $64 - 64 = 0$
   1 root

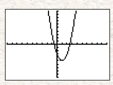




3. $2x^2 - 4x + 9 = 0$ (a b c)
   $(-4)^2 - 4(2)(9)$
   $16 - 72 < 0$
   $-56 < 0$ (no roots)

4. $2x^2 - 4x - 3 = 0$ (a b c)
   $(-4)^2 - 4(2)(-3)$
   $16 + 24 > 0$
   (2 roots)





Mar 12-12:02 PM

Difference of squares

$x^2 - 121 = 0$

$(x - 11)(x + 11) = 0$

$x^2 - 9$

$x^2 - 25$

$\cancel{x^2 + 15}$

$x^2 - 15x = 0$

$x(x - 15) = 0$

$16x^2 - 100$

$(4x - 10)(4x + 10) = 0$

$9r^2 - 49$

$(3r - 7)(3r + 7)$

$3x^2 + 48x = 0$

$3x(x + 16) = 0$

$3x = 0$ $x + 16 = 0$

$x = 0$ $x = -16$

Nov 8-10:42 AM